

Application No. 09/749,405
Amendment dated August 31, 2005
Reply to Office Action of May 31, 2005

Atty. Docket No. 2207/7085
Assignee: Intel Corporation

REMARKS/ARGUMENTS

Claims 1-27 are pending in the application. Reconsideration in view the following remarks is respectfully requested.

Claims 24-26 are rejected under 35 U.S.C. 102(b) as being taught by Tran (U.S. Patent No. 5,822,575). Claims 1-8, 10-15, and 17-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang, Hao, and Patt's "Alternative Implementations of Hybrid Branch Predictors" (herein referred to as Patt) in view of McFarling's "WRL Technical Note TN-36: Combining Branch Predictors" herein referred to as McFarling. Applicants gratefully acknowledge the Office Action's indication that claims 9 and 16 would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims.

The Office Action asserts that the limitation "...[a] branch prediction apparatus, comprising:...a meta predictor to receive as inputs an index value and a branch prediction to generate a misprediction value in accordance with said inputs and said base misprediction history register output..." (e.g., as described in the embodiment of claim 1), can be found in Patt at page 252, column 2, paragraph 4; page 255, column 1, paragraph 2 to column 2, paragraph 3; and Figure 2. Applicant respectfully disagrees.

Column 2, paragraph 4 of Patt discloses a selection mechanism used amongst a set of single scheme predictors. Column 1 paragraph 2 to column 2, paragraph 3 of page 255 disclose the manner in which a 2-level predictor selection scheme selects predictions by using a Branch Predictor Selection Table (BPST) to determine which predictor is most frequently correct.

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However, throughout these cited sections and in the Patt reference as a whole, there is no teaching suggestion or disclosure of at least a meta predictor to receive as inputs an index value and a branch prediction *to generate a misprediction value* as described in embodiments of the present inventions.

The Office Action argues that though described in the specification, Applicants' effort to further clarify "misprediction value" of the embodiment of claim 1 as having amongst other things "the ability to reverse the prediction provided by a base predictor" is improper. Applicants respectfully disagree and submit that these limitations are not to be read in to the claims. The explanation taken from the specification was intended to describe and clarify one functionality of the "misprediction value", and to further point out that such a functionality or anything similar is not disclosed in the cited sections. Applicants argument remains, as affirmed by the cited sections, that the Patt or McFarling reference does not disclose a "misprediction value" as specifically recited in the embodiment of claim 1.

In order to serve as the basis of a proper § 103(a) rejection, each and every element of a claim must be taught, suggested or disclosed in the reference. Therefore, since each and every element of independent claim 1 is not taught, suggested or disclosed by the cited references, the § 103(a) rejection is lacking and should be withdrawn. Independent claims 10, 17, and 20 contain substantively similar limitations and therefore should be allowed as well. Claims 2-8, 11-15, 18-19 and 21-23 depend from the aforementioned allowable independent claims, and therefore are in condition for allowance as well. Applicants further maintain that there is no suggestions or motivation to combine the Patt and McFarling reference beyond the impermissible use of hindsight.

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The Office Action also alleges that Tran has taught restoring a base misprediction history register at column 14 lines 14 to column 15, line 7; column 18, lines 44-62; column 19, lines 31-49; Figure 3; and Figure 4). The Office Action further argues that though described in the specification, Applicants' effort to further clarify the "base misprediction history register" of the embodiment of claim 1 by introducing sections of the specification was improper. Applicants disagree and submit that these limitations are not to be meant to be read in to the claims. The explanation taken from the specification was intended to describe one of multiple functionalities of the "base misprediction history register", and to further point out that such a functionality or anything similar is not disclosed in the cited sections. Applicants argument remains that the base misprediction history register or any equivalent thereof has not been disclosed in Patt or McFarling.

The Office Action further states that the branch tag shift is the equivalent of the "base misprediction history register", as the register's data is changed based upon the misprediction tag. The base misprediction history register is described, among other places, at page 6 line 16 of the specification, which states:

As discussed above, base misprediction history register 110 reflects the correctness of the base predictor standing alone. Unlike global history registers that record whether previous branches were taken or not taken, base misprediction history register 110 records whether previous branch predictions were correctly predicted by the base predictor.

However, nowhere in the extensive sections cited by the Office Action is the disclosure of branch tag shift recording whether previous branch predictions were correctly predicted by the base predictor. Therefore, it is clear that the branch tag shift operation of Tang is not intended to serve the same purpose as the "base misprediction history register" found in embodiments of the

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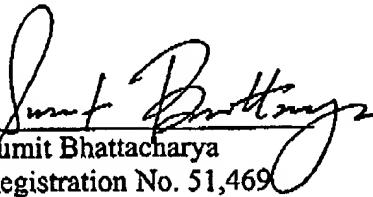
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present invention, and such a disclosure is not found in any of the cited sections of Tran.

Therefore, Applicants submit that branch tag shift concept of Tang cannot properly serve as the basis of a 102 (b) rejection of claim 24. Claims 25-27 depend from the aforementioned allowable independent claims, and therefore are in condition for allowance as well.

In view of the above, Applicants believe that all claims remaining in this application are in condition for allowance, prompt notice of which is respectfully solicited. The Examiner is invited to call the undersigned at (408) 975-7950 to discuss any information concerning this application. The Office is hereby authorized to charge any additional fees under 37 C.F.R. § 1.16 or § 1.17 or credit any overpayment to Deposit Account No. 11-0600.

Respectfully submitted,

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